CLAIM AMENDMENTS

Claim 1. (currently amended) A method for measuring the position of an object, ~~measurement method, in which~~ the steps of said method comprising: calculating a first digital position signal (POS, ~~POS', POS"~~) which represents a position measured by a position sensor ~~is calculated~~ from an input sine signal (SIN) and an input cosine signal (COS) produced by the position sensor[[,]] ; digitally filtering said first position signal for forming a second digital position signal (POS') having a resolution (k) which is higher than that of said first digital position signal (POS); and producing ~~and with~~ an output sine signal (SIN') and an output cosine ~~singal~~ signal (COS') ~~each having a signal period (f_p") which is a multiple of the signal period (f_p') of the input signals (SIN, COS) being produced~~ as a function of the second digital position signal (~~POS,~~ POS' ~~, POS"~~) , the input signals (SIN, COS) having signal periods (f_p) which are multiples of the signal periods ($f_{p"}$) of the output signals (SIN', COS') respectively, such that the frequency of the output signals (SIN', COS') is increased relative to the frequency of the input signals (SIN, COS), respectively.

Claim 2. (cancelled)

Claim 3. (cancelled)

Claim 4. (currently amended)   The method as claimed in Claim 1, further including the step of filtering the position signal through a low pass filter ~~characterized in that the position signal is low pass filtered~~.

Claim 5. (currently amended)   The method as claimed in Claim 1, ~~characterized in that~~ further including the step of filtering the position signal ~~is filtered~~ by forming a sliding mean value.

Claim 6. (currently amended)   The method as claimed in Claim 1, ~~characterized in that~~ further including the step of filtering out of the position signal errors which are typical of the signal transmitter ~~are filtered out of the position signal~~.

Claim 7. (currently amended)   The method as claimed in claim 6, ~~characterized in that the~~ wherein the step of filtering errors out of the position signal (POS) includes the step of ~~position signal (POS) is filtered by~~ using stored error curves (ERR) which are dependent on the signal transmitter.

Claim 8. (currently amended)   The method as claimed in Claim 1, ~~characterized in that~~ further including the step of calculating the position signal (POS) ~~is calculated~~ from the arctan (atan) essentially of the quotient from the input sine signal (SIN) and the input cosine signal (COS).

Claim 9. (currently amended) The method as claimed in Claim 1, ~~characterized in that~~ <u>further including the step of error-correcting</u> the input sine signal (SIN) and the input cosine signal (COS) ~~are error corrected~~ before ~~the calculation of~~ <u>calculating</u> the position signal (POS).

Claim 10. (currently amended) The method as claimed in claim 9, ~~characterized in that~~ <u>further including the step of compensating for</u> different amplitudes of the input sine signal (SIN) and of the input cosine signal (COS) ~~are compensated for~~ in the ~~error correction process~~ <u>step of error-correcting</u>.

Claim 11. (currently amended) The method as claimed in claim 9, ~~characterized in that~~ <u>further including the step of regulating out</u> discrepancies between the offset in the input sine signal (SIN) and/or the input cosine signal (COS) and a nominal offset ~~are regulated out~~ during the ~~error correction process~~ <u>step of error-correcting</u>.

Claim 12. (currently amended) The method as claimed in Claim 9, ~~characterized in that~~ <u>further including the step of correcting</u> the phase errors in the input sine signal (SIN) and/or the input cosine signal (COS) ~~are corrected~~ during the ~~error correction process~~ <u>step of error-correcting</u>.

Claim 13. (currently amended) The method as claimed in Claim 9, ~~characterized in that~~ <u>further including the step of</u>

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<u>calculating</u> the correction values which are used to correct the errors in the input sine signal (SIN) and/or in the input cosine signal (COS) ~~are calculated~~ from the input sine signal (SIN) and/or from the input cosine signal (COS) themselves or itself.

Claim 14. (currently amended) The method as claimed in Claim 1, ~~characterized in that~~ <u>further including the step of producing</u> the position signal (POS, POS', POS") ~~is produced~~ in the form of an essentially periodically varying, digital numerical value from k bits, from which a word element (m word) is read from m successive bits.

Claim 15. (currently amended) The method as claimed in Claim 14, ~~characterized in that~~ <u>further including the step of using</u> the m word ~~is used~~ for addressing at least one output table (16a, 16b) ~~in order to produce~~ <u>for producing</u> the output signals (SIN', COS').

Claim 16. (currently amended) The method as claimed in Claim 14, ~~characterized in that~~ <u>further including the step of shifting</u> the position (k_m) of the m word within the k word ~~is shifted~~ by means of a read unit (15), ~~in order to change~~ <u>for changing</u> the frequency of the output signals (SIN', COS').

Claim 17. (currently amended) The method as claimed in Claim 1, ~~characterized in that~~ <u>further including the step of</u>

increasing the frequency of the input signals (SIN, COS) ~~is increased~~ by an integer factor.

Claim 18. (currently amended) The method as claimed in Claim 1, ~~characterized in that~~ <u>further including the step of increasing</u> the frequency of the input signals (SIN, COS) ~~is increased~~ by the factor 2^{k-km} in the output signals (SIN', COS').

Claim 19. (currently amended) The method as claimed in Claim 1, ~~characterized in that~~ <u>further including the step of reading</u> the output signals (SIN', COS') ~~are read~~ as a function of the position signal (POS, POS', POS") from at least one output table (16a, 16b) containing digitized values ($*(0)$, ..., $*(2^m-1)$) of a sine function.

Claim 20. (currently amended) The method as claimed in Claim 15, ~~characterized in that~~ <u>further including the steps of using</u> two output tables (16a, 16b) ~~are used~~, and <u>associating, respectively, the two output tables</u> ~~are respectively associated~~ with the output sine signal (SIN') and the output cosine signal (COS').

Claim 21. (currently amended) The method as claimed in Claim 1, ~~characterized in that~~ <u>further including the step of producing</u> the input signals (SIN, COS) ~~are produced~~ from a position or angle measurement system (2).

Claim 22. (currently amended) The method as claimed in Claim 1, ~~characterized in that~~ further including the step of matching the quadrant position of a reference signal (REF) relative to the input signals (SIN, COS) ~~is matched~~ to the output signals (SIN', COS').

Claim 23. (currently amended) A position measurement system (1) for processing of signals (SIN, COS, REF) from a position sensor ~~(1)~~ (7) with an input interface (21) to which an input sine signal (SIN) and an input cosine signal (COS) from ~~a~~ the position sensor (7) can be supplied during operation, the position measurement system having a calculation unit (30) by means of which a digital position signal (POS, ~~POS', POS"~~), which represents a position measured by the position sensor, can be produced from the input sine signal (SIN) and the ~~output~~ input cosine signal (COS)[[,]] ; ~~and having~~ a signal generation unit (16), by means of which an output sine signal (SIN') and an output cosine signal (COS') can be produced as a function of the position signal (POS), said input sine signal (SIN) and said input cosine signal (COS) each having signal periods which are multiples of the output sine signal (SIN') and the output cosine signal (COS') periods, respectively; and a digital filter (13) arranged between the calculation unit (30) and a register (14), wherein the position signal (POS) has a resolution of i bits upstream of the digital filter, and has a resolution of k bits downstream from the digital filter, where k > i ~~respectively with~~

~~a signal period which is a multiple of the input sine signal (SIN) and the input cosine signal (COS)~~.

Claim 24. (currently amended) The ~~apparatus~~ system as claimed in claim 23, ~~characterized in that a~~ wherein said register (14) is provided in which the atan value can be stored as a k word with a resolution of k bits, and an addressing unit is provided, by means of which an m word comprising m successive bits where m<k can be read from the k word.

Claim 25. (currently amended) The ~~apparatus~~ system as claimed in Claim 23, ~~characterized in that~~ wherein a signal conditioning device (23) is arranged between the calculation unit (30) and the input interface (21), by means of which the signal errors in the input sine signal (SIN) can be corrected using the input cosine signal (COS).

Claim 26. (currently amended) The ~~apparatus~~ system as claimed in Claim 23 ~~24~~ , ~~characterized in that a digital filter (13) is arranged between the calculation unit (30) and the register (14), by means of which~~ wherein errors which are dependent on the signal transmitter can be filtered out of the position signal (POS) by said digital filter (13).

Claim 27. (currently amended) The ~~apparatus~~ system as claimed in Claim 23, ~~26, characterized in that~~ wherein the

digital filter (13) is essentially in the form of a low-pass filter.

Claim 28. (cancelled)

Claim 29. (currently amended) The ~~apparatus~~ system as claimed in Claim 23, ~~characterized in that~~ wherein the ~~apparatus~~ system has a position measurement means (2), by means of which the input signals (SIN, COS) can be produced as signals which represent the movement of a ~~meas~~ measurement means.

Claim 30. (currently amended) The method as claimed in Claim 10, ~~characterized in that~~ further including the step of regulating out discrepancies between the offset in the input sine signal (SIN) and/or the input cosine signal (COS) and a nominal offset ~~are regulated out~~ during the ~~error correction process~~ step of error-correcting.

Claim 31. (currently amended) The method as claimed in Claim 15, ~~characterized in that~~ further including the step of shifting the position (k_m) of the m word within the k word ~~is shifted~~ by means of a read unit (15), ~~in order to change~~ for changing the frequency of the output signals (SIN', COS').

Claim 32. (currently amended) The ~~apparatus~~ system as claimed in Claim 24, ~~characterized in that~~ wherein a signal conditioning device (23) is arranged between the calculation unit

(30) and the input interface (21), by means of which the signal errors in the input sine signal (SIN) can be corrected using the input cosine signal (COS).

Claim 33. (cancelled)

Claim 34. (new) The method as claimed in Claim 1, further including the step of compensating for the time delay that occurs as a result of the digital filtering of the position signal.

Claim 35. (new) A method for measuring the position of an object, the steps of said method comprising: calculating a digital position signal (POS, POS', POS") which represents a position measured by a position sensor from an input sine signal (SIN) and an input cosine signal (COS) produced by the position sensor; producing an output sine signal (SIN') and an output cosine signal (COS') as a function of the digital position signal (POS, POS, POS"), the signal periods $(f_{p'})$ of the input signals (SIN, COS) being multiples of the signal periods $(f_{p''})$ of the output signals (SIN', COS'), respectively; and error-correcting the input signal (SIN) and the input cosine signal (COS) before calculating the position signal (POS).

Claim 36. (new) The method as claimed in Claim 35, further including the step of compensating for different amplitudes of the input sine signal (SIN) and of the input cosine signal (COS) in the step of error-correcting.

Claim 37. (new)   The method as claimed in claim 35, further including the step of regulating out discrepancies between the offset in the input sine signal (SIN) and/or the input cosine signal (COS) and a nominal offset during the step of error-correcting.

Claim 38. (new)   The method as claimed in Claim 35, further including the step of correcting the phase errors in the input sine signal (SIN) and/or the input cosine signal (COS) during the step of error-correcting.

Claim 39. (new)   The method as claimed in Claim 35, further including the step of calculating the correction values which are used to correct the errors in the input sine signal (SIN) and/or in the input cosine signal (COS) from the input sine signal (SIN) and/or from the input cosine signal (COS) themselves or itself.

Claim 40. (new)   The method as claimed in Claim 35, further including the step of producing the position signal (POS, POS', POS") in the form of an essentially periodically varying, digital numerical value from k bits, from which a word element (m word) is read from m successive bits.

Claim 41. (new)   The method as claimed in Claim 35, further including the step of using the m word for addressing at least one output table (16a, 16b) for producing the output signals (SIN', COS').

Claim 42. (new) The method as claimed in Claim 35, further including the step of shifting the position (k_m) of the m word within the k word by means of a read unit (15), for changing the frequency of the output signals (SIN', COS').

Claim 43. (new) The method as claimed in Claim 35, further including the step of increasing the frequency of the input signals (SIN, COS) by the factor 2^{k-km} in the output signals (SIN', COS').

Claim 44. (new) The method as claimed in Claim 35, further including the step of reading the output signals (SIN', COS') as a function of the position signal (POS, POS', POS") from at least one output table (16a, 16b) containing digitized values ($*(0)$, ..., $*(2^m-1)$) of a sine function.

Claim 45. (new) The method as claimed in Claim 35, further including the step of matching the quadrant position of a reference signal (REF) relative to the input signals (SIN, COS) to the output signals (SIN', COS').

Claim 46. (new) A method for measuring the position of an object, the steps of said method comprising: calculating a digital position signal (POS, POS', POS"), which represents a position measured by a position sensor, from an input sine signal (SIN) and an input cosine signal (COS) produced by the position sensor; producing an output sine signal (SIN') and an output

cosine signal (COS') as a function of the digital position signal (POS, POS', POS"), the signal periods $(f_{p'})$ of the input signals (SIN, COS) being multiples of the signal periods $(f_{p"})$ of the output signals (SIN', COS'); and matching the quadrant position of a reference signal (REF) relative to the input signals (SIN, COS) to the output signals (SIN', COS').

Claim 47. (new) The method as claimed in Claim 46, further including the step of matching the phase angle and the pulse duration of the reference signal to the increased number of signal periods in the output signals (SIN', COS').

Claim 48. (new) The method as claimed in Claim 46, further including the step of newly synthesizing the reference signal (REF).

Claim 49. (new) The system as claimed in Claim 26, wherein a signal conditioning unit (23) is arranged before the calculation unit (30), said signal conditioning unit (23) adapted to calculate and correct discrepancies from the manual states of the input sine signal (SIN) and the input cosine signal (COS).

Claim 50. (new) The system as claimed in Claim 23, wherein a unit (19) is provided for synthesizing a reference signal (REF), said synthesized reference signal being matched to the output sine signal (SIN') and the output cosine signal (COS').

Claim 51. (new) The system as claimed in Claim 23, wherein compensation units (24a, 24b) are provided before the calculation unit (30), said compensation units (23a, 24b) adapted to correct discrepancies in the input sine signal (SIN) and input cosine signal (COS) from their numerical value.

Claim 52. (new) A position measurement system (1) for processing of signals (SIN, COS, REF) from a position sensor (7) with an input interface (21) to which an input sine signal (SIN) and an input cosine signal (COS) from a position sensor (7) can be supplied during operation, the position measurement system having a calculation unit (30) by means of which a digital position signal (POS, POS', POS"), which represents a position measured by the position sensor, can be produced from the input sine signal (SIN) and the output cosine signal (COS); a signal generation unit (16), by means of which an output sine signal (SIN') and an output cosine signal (COS') can be produced as a function of the position signal (POS), respectively, the signal periods of said input signals (SIN, COS) being multiples of the signal periods of said output signals (SIN', COS'), respectively; and a signal conditioning unit (23) arranged before the calculation unit (30), said signal conditioning unit (23) adapted to calculate and correct discrepancies from the nominal states of the input sine signal (SIN) and the input cosine signal (COS).

Claim 53. (new) The system as claimed in Claim 52, wherein the signal conditioning unit (23) comprises a feedback loop by

means of which the calculated discrepancies can be fed back to the input sine signal (SIN) and the input cosine (COS).

Claim 54. (new) The system as claimed in Claim 52, wherein a register (14) is provided in which the atan value can be stored as a k word with a resolution of k bits, and an addressing unit is provided, by means of which an m word comprising m successive bits where m<k can be read from the k word.

Claim 55. (new) The system as claimed in Claim 52, wherein a signal conditioning device (23) is arranged between the calculation unit (30) and the input interface (21), said signal conditioning device (23) adapted to correct signal errors in the input sine signal (SIN) using the input cosine signal (COS).